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**Patentanmeldung Nr. Patent application No. Demande de brevet n°**

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Der Präsident des Europäischen Patentamts;  
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets  
p.o.

**I.L.C. HATTEN-HECKMAN**

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**Blatt 2 der Bescheinigung**  
**Sheet 2 of the certificate**  
**Page 2 de l'attestation**

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International Business Machines Corporation  
Armonk, NY 10504  
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Method and system for automized and synchronous execution of customized code on off-loaded  
retrieved documents in a document processing system

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## D E S C R I P T I O N

**Method and System for Automized and Synchronous Execution of Customized Code on Off-loaded Retrieved Documents in a Document Processing System**Background of the Invention

The invention relates to document processing environments with large document repositories and, more specifically, to a method and system for processing off-loaded and/or retrieved documents in a document processing.

Known client mailing applications like Lotus™ Notes™ or Microsoft™ Outlook™ contain continuously growing document repositories, namely the incoming and outgoing notes or emails often including large attachments like text documents, graphics or even storage consuming digitized pictures. Therefore, e.g. a Lotus Notes application uses a Lotus Domino™ database from which a tool like IBM Content Manager CommonStore™ for Lotus Domino (CSLD) is used to move documents stored in that database to an archive physically located on a different device like a tape storage. CSLD thereupon allows to access documents that have previously been archived.

CSLD also allows to access documents that have been archived from any archive client application (e.g. scanning applications, CommonStore for SAP™, etc). When documents are retrieved from the archive to a Notes database, a Lotus Notes document is created.

Lotus Notes supports writing of customized code which, for instance, can be used to trigger workflow based on the state of off-loaded documents.

The drawback of the existing approach is that customized code

can not be invoked synchronous to an archiving/off-loading and retrieval process.

#### Summary of the Invention

It is therefore an object of the present invention to provide a method and system as described beforehand which enable to invoke customized code synchronous to an off-loading or retrieval process.

It is another object to provide such a method and system transparent to an end user without requiring any user interaction.

The above objects are achieved by the features of the independent claims. Advantageous embodiments are subject matter of the subclaims.

The underlying idea is to provide a code component, in particular a plug-in, that is automatically started before a document is off-loaded, after it has been off-loaded or after it has been retrieved.

The invention enables an advantageous pre-/post-processing of documents in the above described document processing environment. Invocation of at least one agent and execution of customized code at a well-defined time, i.e. synchronous with the underlying document processing step or event.

#### Brief Description of the Drawings

In the following, the present invention is described in more detail by way of embodiments from which further features and advantages of the invention become evident, where

Fig. 1 shows the various steps during archiving of a number of documents, invoking pre- and post-archiving agents in accordance with the invention; and

Fig. 2 shows an example of how pre- and post-archiving agents can be applied.

#### Detailed Description of the Drawings

In Fig. 1, a user selects 101 a number of documents for archiving. The selection step creates 102 an archiving request, in the present example, to IBM Content Manager CommonStore™ for Lotus Domino (CSLD). CSLD is a tool to move Lotus Notes documents in various formats to an archive.

CSLD prepares 103 the next document for archiving. If configured, CSLD invokes 104 a pre-processing agent on the current document. When the agent is finished, CSLD archives 105 the document. Then, if configured, CSLD invokes 106 a post-processing agent on the current document. When the agent is finished, CSLD marks 107 the document as 'archived'.

Fig. 2 illustrates how pre- and post-archiving agents can be used to compute the amount of archived data and write it to a database for accounting purposes.

It is noted that the dotted lines in the diagram separate the main path of execution from the pre- and post-processing path.

A user selects 201 a number of documents for archiving. The selection step creates 202 an archiving request, in the present example, to CSLD. CSLD prepares 203 the next document for archiving and invokes the pre-archiving agent on it. The code in this agent computes 204 the current size of the document and the number of attachments in the document. These values are written 205 to special fields in the current document.

When the agent has finished, CSLD archives 206 the document and invokes the post-archiving agent. The code in this agent removes 207 attachments and rich text items from the current document. After recalculating 208 the size of the document, the post-archiving agent logs 209 the size difference to an accounting database.

Finally, when the post-archiving agent is finished, CSLD marks 210 the document as 'archived'.

A similar procedure can be implemented using post-retrieval agents. In such a scenario, for instance, the amount of retrieved data can be written to an accounting database.

In CSLD, pre- and post-processing plug-ins are realized as the following agent invocation exits:

- **Pre archiving agent:** A Notes agent that is invoked on a document right before it is archived. Usually used to prepare a document for archiving;
- **Post archiving agent:** A Notes agent that is invoked on a document after it has been archived successfully. Can be used to delete the document, move it to a certain folder, create a stub document to release resources, collect accounting information, trigger workflows, etc.;
- **Post retrieval agent:** A Notes agent that is invoked on a document after it has been retrieved from an archive. Can be used to set security properties, set workflow flags, write the document to a folder, etc.

All automatic agents are configured based on the Notes document form, i.e. for documents of different forms different agents can be configured. The agents are invoked synchronously. The current document being archived/retrieved is passed to the agent via the



session's document context. This allows to code the agent in LotusScript or Java. Errors occuring during agent execution are written to the CSLD trace file.

## C L A I M S

1. A method for processing off-loaded and/or retrieved documents in a document processing system where requests are executed by an off-loading and retrieval process, comprising the steps of:  
  
Providing an interface to plugin customized code in order to execute the customized code;  
  
invoking customized code plugged into the interface when a request is issued thus being synchronous to the off-loading and/or retrieval process.
2. Method according to claim 1, wherein running the customized code synchronously to process documents before they are off-loaded, after they have been off-loaded, and/or after they have been retrieved.
3. Method according to claim 1 or 2, wherein providing a pre-archiving code or component being invoked on a document right before it is off-loaded.
4. Method according to any of claims 1 to 3, wherein providing a post-archiving code or component being invoked on a document after it has been off-loaded successfully.
5. Method according to any of the preceding claims, wherein providing a post-retrieval code or component being invoked on retrieved documents.
6. Method according to any of claims 3 to 5, wherein the code or component runs inside a plug-in architecture.
7. Method according to any of the preceding claims, wherein selecting a number of documents for archiving;

and wherein executing the following steps in a loop:

creating an archiving request to an archiving engine of the document processing system;

preparing a next document for archiving;

invoking an pre-archiving agent on the current document;

when the pre-archiving agent is finished, archiving the current document;

invoking the post-archiving agent on the current document; and

when the post-archiving agent is finished, marking the document as 'archived'.

1 / 2

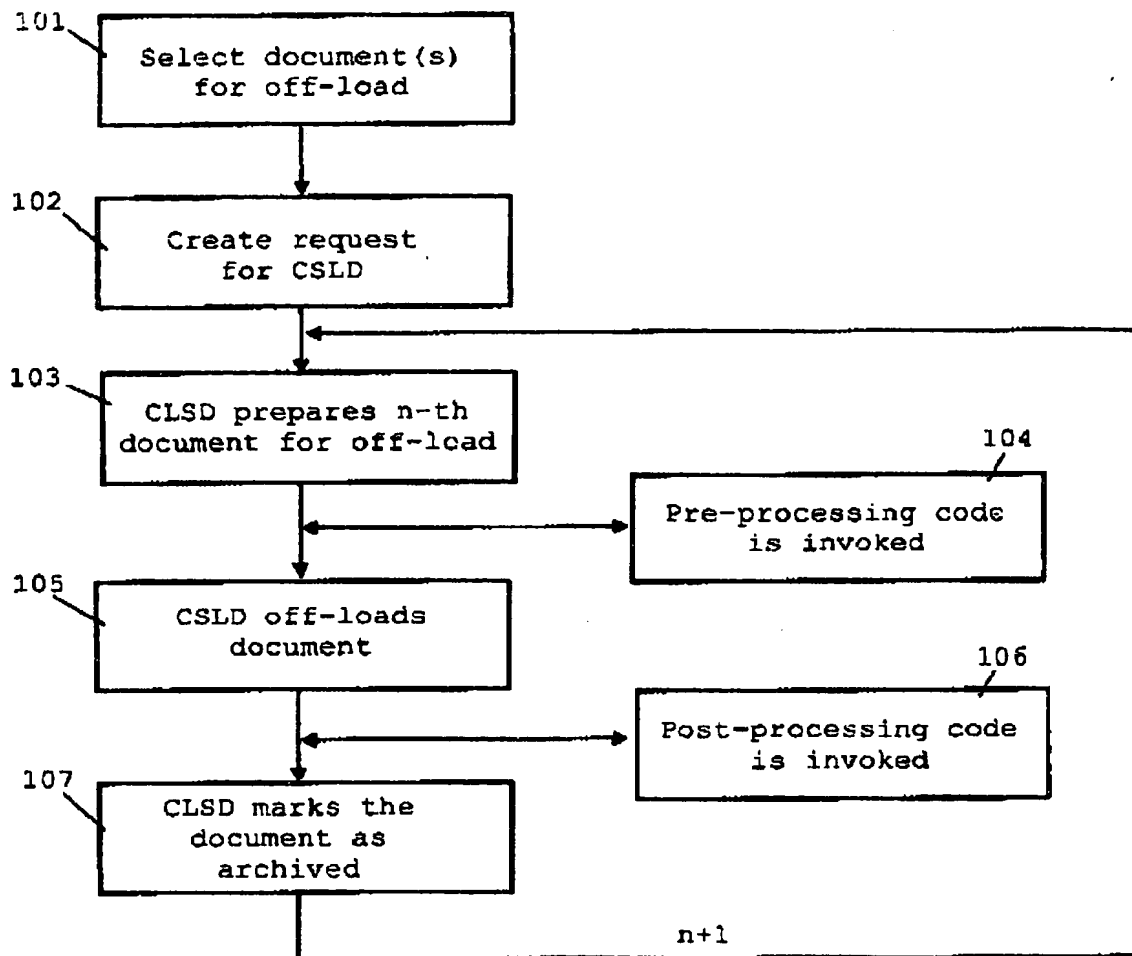


FIG. 1

2 / 2

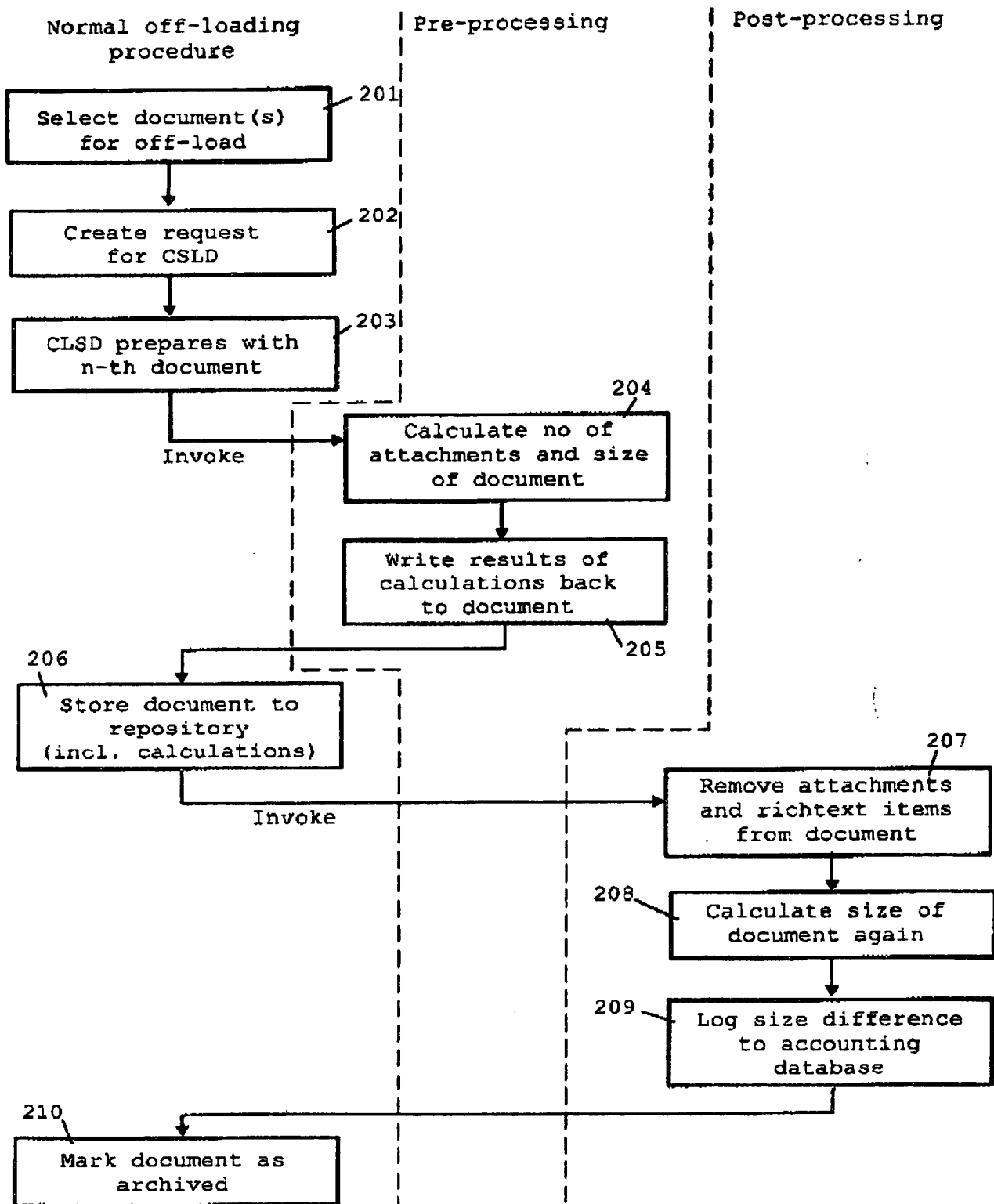


FIG. 2

## A B S T R A C T

Disclosed are a method and system for executing customized code on off-loaded or retrieved documents in a document processing environment. The underlying idea is to provide a code component, in particular a plug-in, that is automatically started before a document is off-loaded, after it has been off-loaded or after it has been retrieved.

The invention enables an advantageous pre-/post-processing of documents in the above described document processing environment. Invocation of at least one agent and execution of customized code at a well-defined time, i.e. synchronous with the underlying document processing step or event. (Fig. 1)